

## WHAT IS CLAIMED

1. A process for generating heat by exothermic nuclear reactions in which reactions deuterium participates, and in which deuterium flows out of an electrically polarized solid-electrolyte layer into a metal reactor plate, and in which deuterium flows out of the metal plate into a second polarized solid-electrolyte layer, with the reactor plate containing one or more diffusion-impeding non-metallic layers.
2. The process of Claim 1 in which at least one diffusion-impeding layer is made of CaO.
3. The process of Claim 1 in which the metal reactor plate is made of metal selected from a group comprising Pd or Pd alloy.
4. The process of Claim 1 in which the solid-electrolyte layers are made of poly ethylene oxide (PEO), containing deuterided phosphoric acid.
5. A process for generating heat by exothermic nuclear reactions in which reactions deuterium participates, and in which deuterium gas is adsorbed onto the inflow surface of a metal reactor plate, from which reactor plate deuterium flows out of the outflow surface of the reactor plate into an electrically polarized solid-electrolyte layer, with the reactor plate containing at least one diffusion-impeding non-metallic layer.
6. The process of Claim 5 in which the one or more diffusion-impeding layers are made of CaO.
7. The process of Claim 5 in which the metal reactor plate is made of metal selected from a group comprising Pd and Pd alloy.
8. The process of Claim 5 in which the solid-electrolyte layer is made of poly ethylene oxide (PEO), containing deuterided phosphoric acid.
9. A process for generating heat by exothermic nuclear reactions in which reactions deuterium participates, and in which deuterium flows out of

an electrically polarized solid-electrolyte layer into a metal reactor plate, and in which deuterium flows out of the metal plate into a second polarized solid-electrolyte layer, with the reactor plate containing a dispersion of diffusion-impeding non-metallic inclusions.

10. The process of Claim 9 in which the non-metallic inclusions are made of CaO.

11. The process of Claim 9 in which the metal reactor plate is made of metal selected from a group comprising Pd and Pd alloy.

12. The process of Claim 9 in which the solid-electrolyte layers are made of poly ethylene oxide (PEO), containing deuterided phosphoric acid.

13. A process for generating heat by exothermic nuclear reactions in which reactions deuterium participates, and in which deuterium gas is adsorbed onto the inflow surface of a metal reactor plate, from the reactor plate deuterium flows out of the outflow surface of the reactor plate into an electrically polarized solid-electrolyte layer, with the reactor plate containing a dispersion of diffusion-impeding non-metallic inclusions.

14. The process of Claim 13 in which the non-metallic inclusions are made of CaO.

15. The process of Claim 13 in which the metal reactor plate is made of metal selected from a group comprising Pd or Pd alloy.

16. The process of Claim 13 in which the solid-electrolyte layer is made of poly ethylene oxide (PEO), containing deuterided phosphoric acid.

17. A process for generating heat by exothermic nuclear reactions in which reactions deuterium participates, and in which deuterium gas flows from a deuterium gas reservoir into and through an input electrolysis cell containing a solid electrolyte layer interfaced with a metal reactor plate, from which reactor plate deuterium flows out of the outflow surface of the reactor

plate into the deuterium gas reservoir, thereby completing a gas circulation loop, with the reactor plate containing at least one diffusion-impeding non-metallic layer.

18. A process for generating heat by exothermic nuclear reactions in which reactions deuterium participates, and in which deuterium gas flows from a deuterium gas reservoir into and through an input electrolysis cell containing a solid electrolyte layer interfaced with a metal reactor plate, from which reactor plate deuterium flows out of the outflow surface of the reactor plate into the deuterium gas reservoir, thereby completing a gas circulation loop, with the reactor plate containing a dispersion of diffusion-impeding non-metallic inclusions.

19. A process for generating heat by exothermic nuclear reactions in which reactions deuterium participates, and in which deuterium flows out of an electrically polarized solid-electrolyte layer into a metal reactor plate, and in which deuterium flows out of the metal plate into a second polarized solid-electrolyte layer, with the reactor plate containing at least one diffusion-impeding non-metallic layer, and in which process flow direction alternates in response to changes in potentials applied across the solid electrolyte layers.

20. A process for generating heat by exothermic nuclear reactions in which reactions deuterium participates, and in which deuterium flows out of an electrically polarized solid-electrolyte layer into a metal reactor plate, and in which deuterium flows out of the metal plate into a second polarized solid-electrolyte layer, with the reactor plate containing a dispersion of diffusion-impeding non-metallic inclusions, and in which the process flow direction alternates in response to changes in potentials applied across the solid-electrolyte layers.